

DESCRIPTION OF A NEW GRASS-LIVING SPECIES OF *YOSHINOTHrips* KUDÔ, AND A NEWLY RECORDED GENUS OF THRIPINAE IN CHINA (THYSANOPTERA, THRIPIDAE)

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Abstract A new grass-living species of the small genus *Yoshinothrips* Kudô, 1985 (Thripidae, Thripinae), namely, *Y. tianmushanensis* Mirab-balou *et al.*, sp. nov., is described and illustrated from China. A key is constructed for identifying all species of this genus. In addition, *Pseudoxythrips* Priesner, 1940 and *P. dentatus* (Knechtel, 1923) are recorded for the first time from China.

Key words Thysanoptera, Thripidae, *Yoshinothrips*, new species, *Pseudoxythrips*, new record, China.

1 Introduction

The Thripinae is the largest of the four subfamilies in the family Thripidae (Thysanoptera, Terebrantia) (Mound, 2011). This subfamily includes about 1 700 species in 220 genera worldwide (Mound, 2011). Of these, 216 species in 55 genera are known in China (Mirab-balou *et al.*, 2011). The members of this subfamily live in flowers, on leaves, and some species live in both habitats, and a few species are known as obligate predators (Mound & Marullo, 1996).

Yoshinothrips Kudô, 1985 is a small genus of *Trichromothrips* genus-group (Thripidae, Thripinae) (Masumoto & Okajima, 2005) with three valid species in the world (Mound, 2011), all of them from Asia (Kudô, 1985; Nonaka & Jangvitaya, 1993). Although two species in this genus, *Y. pasekamui* Kudô, 1985 and *Y. ponkamui* Kudô, 1985, described from Japan were taken on grasses (Kudô, 1985), the third species, *Y. thailandicus* Nonaka & Jangvitaya, 1993 was from bamboo in Thailand (Nonaka & Jangvitaya, 1993). In China, only two species have been recorded; *Y. pasekamui* (on bamboo leaves, *Phyllostachys glauca*, in Jiangsu Province) and *Y. ponkamui* (on grasses and candle tree (*Parmentiera cereifera*) in Jiangsu and Fujian Provinces) (Zhang and Tong, 1996; Mirab-balou *et al.*, 2011).

In our sampling of thrips from China during 2009–2011 one undescribed species and one unknown species for China were collected from plant family Poaceae. These two species form the subject of the present study, along with a key for identification of the species of *Yoshinothrips* occurring in China including Taiwan.

2 Materials and Methods

Specimens were collected from Zhejiang and Shandong Provinces, China. Thrips were prepared onto slides following Mirab-balou & Chen (2010). All descriptions, measurements and photos were made with a Leica DM IRB microscope using DFC300 FX. The type specimens are deposited in the Institute of Insect Sciences, Zhejiang University, Hangzhou, China (ZJUH). All measurements are given in micrometers (μm). Nomenclatural information for all thrips taxa mentioned here are web-available (Mound, 2011).

Genus *Yoshinothrips* Kudô

Yoshinothrips Kudô, 1985: 81.

This genus was first erected by Kudô (1985) based on *Y. pasekamui* Kudô as type species. The members of this genus are readily distinguished from other related genera by presence of one pair of dorso-apical setae on antennal segment I, simple sense cone on antennal segment III, either simple or forked sensoria on antennal segment IV, lack of ocellar setae I on head, and absence of posteromarginal comb on abdominal tergite VIII (Kudô, 1985; Mound & Ng, 2009).

Key to the species of the genus *Yoshinothrips* Kudô

1. Mesoscutum without median setae *Y. thailandicus* Nonaka *et al.* Jangvitaya
- Mesoscutum with one pair of median setae 2
2. Metasternum without spinula *Y. pasekamui* Kudô
- Metasternum with spinula (even though vestigial) 3
3. Antennal segment IV with forked sense cone. Pronotum with three pairs of posteromarginal setae. Abdominal tergite IX with S1 setae shortest, S2 longest; abdominal segments I–V brown, VI–X dark brown. Femur brown as dark as tibia ... *Y. ponkamui* Kudô
- Antennal segment IV with simple sense cone. Pronotum with two pairs of posteromarginal setae (Fig. 5). Setae S1–S3 on tergite IX long and subequal (Fig. 6). Abdominal segments I–III brown, IV

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Received 15 Aug. 2011, accepted 15 Mar. 2012.

yellow, V - X dark brown. Femur paler than tibia (Fig. 8) ...
..... *Y. tianmushanensis* Mirab-balou et Chen, sp. nov.

***Yoshinothrips tianmushanensis* Mirab-balou et Chen, sp. nov. (Figs 1 - 11)**

Material examined. China. Holotype 1 ♀, on grass, Tianmu Mountain National Nature Reserve ($30^{\circ} 18' - 30^{\circ} 25' N$, $119^{\circ} 24' - 119^{\circ} 28' E$; alt. 1506 m), Hangzhou, Zhejiang Province, M. Mirab-balou, 3 July 2010. Paratype 1 ♀, on grass, Jiuxi ($30^{\circ} 15' N$, $120^{\circ} 10' E$; alt. 18 m), Hangzhou, Zhejiang Province, China, M. Mirab-balou, 13 Sep. 2009, (in ZJUH).

Description. Female macroptera. Distended body length about 1.8 mm. Body bicolored (Fig. 1); head, abdominal segments II, III and X brown; thorax, abdominal segment I yellowish-brown, IV pale yellow, and V - IX dark brown. Fore leg brownish yellow; mid and hind femora yellowish with apical brown; mid and hind tibiae dark brown (Fig. 8); all tarsi yellow. Forewing with two pale bands, the rest brown; scale brown (Fig. 9). Antennae segments I, VII - VIII brown; II yellowish brown, III - IV yellow, V brown with half basal yellow, VI brown with basal 1/3 yellow (Fig. 2).



Fig. 1. *Yoshinothrips tianmushanensis* Mirab-balou et Chen, sp. nov., female.

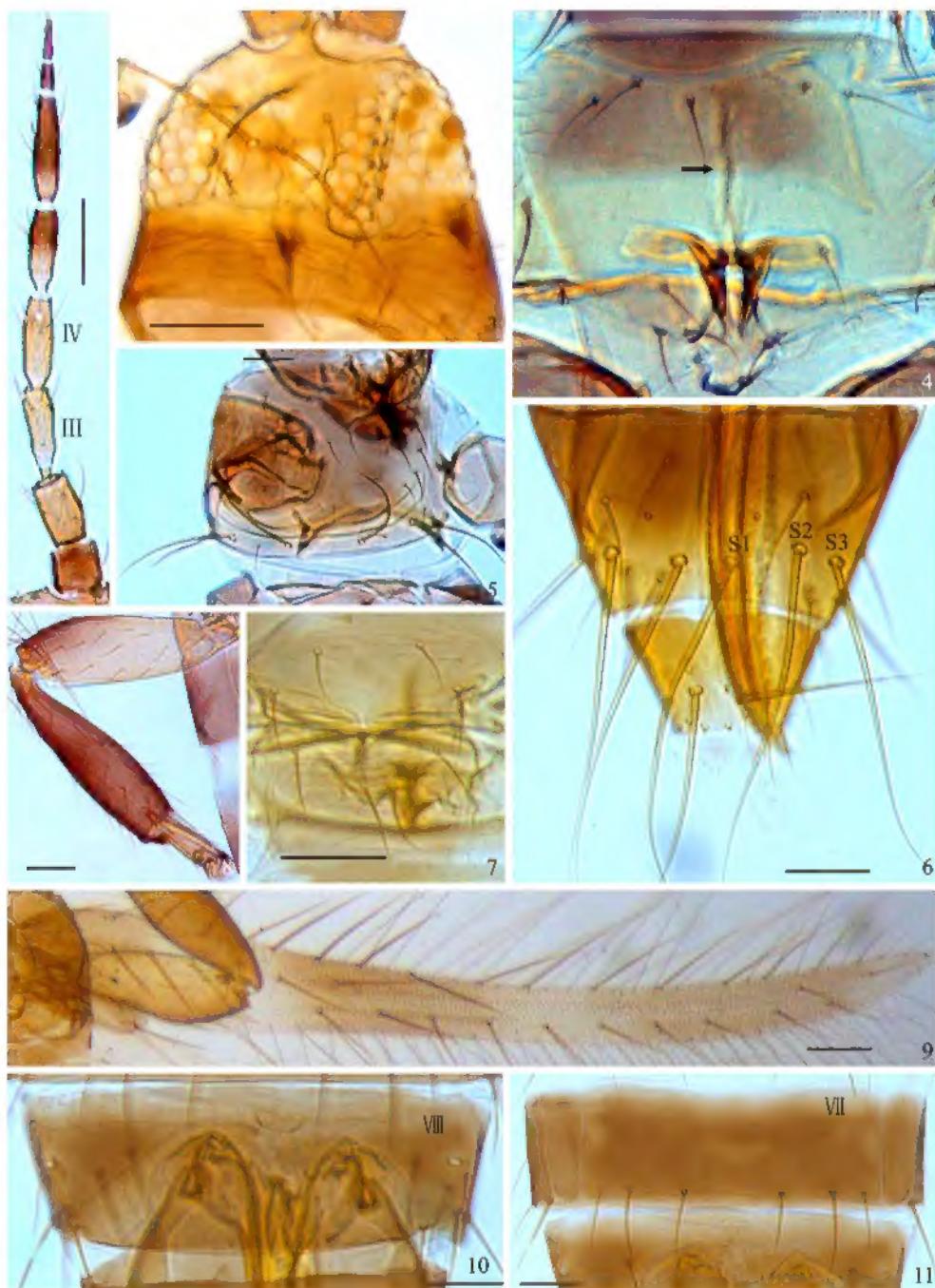
Head. Head 1.4 - 1.5 times as wide as long, constricted behind compound eyes, with weak and transverse striate on posterior (Fig. 3); mouth-cone short and rounded at apex; maxillary palps 3-segmented. Compound eyes more or less bulging.

Ocellar setae pair I absent, pair III well-developed, situated between ocellar triangle, near to posterior ocelli and 9 - 10 times as long as distance between their bases (Fig. 3). Five pairs of small postocular setae present. Antennae 8-segmented, with a pair of median dorsal apical setae on antennal segment I; segment II with distinct subbasal setae and two dorso-apical setae; antennal segments III and IV with simple sensoria (Fig. 2); segments III - VI with rows of microtrichia on both dorsal and ventral surfaces; segments V and VI with small simple sense cone on outer margin. Antennal segments I to VIII length/width: 1.0, 1.7, 3.3, 3.0, 3.0, 4.2, 2.4, and 4.7.

Thorax. Pronotum 1.2 - 1.3 times as wide as long, smooth, larger than head, with 18 - 20 discal setae (Fig. 5); two pairs of posteroangular setae well developed and long, inner setae much longer than outer one; posterior margin with 2 pairs of setae, inner setae well-developed and nearly equal to inner posteroangular setae. Mesoscutum transversely striate on median 1/3, with one pair of median setae (Fig. 7); metascutum with transversely sculptured, median pair of setae behind anterior margin (Fig. 7), metanotal campaniform sensilla absent. Meso- and metathoracic furca both with spinula, although vestigial on metasternum (Fig. 4). Forewings upper vein with 2 apical setae and 7 - 8 basal setae; hind vein with 9 - 10 setae; scale with four veinal setae and one discal setae; posterior fringe hairs wavy (Fig. 9). Tarsi 2-segmented.

Abdomen. Abdominal tergites without ctenidia or posteromarginal craspeda; tergites unsulpture, weakly transversely striate on anterior margin; tergites III - VII with 7 setae on each side, median setae smaller than other setae; S1 - S3 on tergite IX nearly equal, S1 1.6 - 1.7 times as long as tergite IX (Fig. 6); tergite VIII without comb on posterior margin (Fig. 10); all tergites with only one pair of campaniform sensilla. Abdominal sternites without discal setae; sternites III - VII with 3 pairs of setae at posterior margin; setae S1 - S3 on sternite VII slightly in front of posterior margin, but S2 - S3 are located slightly ahead of B1 (Fig. 11). Ovipositor serrate and well-developed.

Measurements. Length (width): body 1870 - 1920 (380 - 410); head 100 - 105 (145 - 153); interocellar setae 66.5 - 67.5; compound eye 73 - 74 (59 - 61); distance between to compound eyes 6.2 - 7.2. Antenna 370 - 375; I 26 (27); II 40 (24), III 52 (16), 3.25 times as long as wide; IV 50 (17), 2.94 times as long as wide; V 46 (15), 3.06 times as long as wide; VI 60 (14), 4.28 times as long as wide; VII 17 (7); VIII 22 (5). Pronotum 185 - 190 (225 - 235); outer posteroangular setae 75, inner posteroangular setae 95; posteromarginal setae 85;



Figs 2–11. *Yoshinotrips tianmushanensis* Mirab-balou & Chen, sp. nov. 2. Antenna. 3. Head, dorsal view. 4. Metanotum (metaspinula). 5. Pronotum. 6. Abdominal tergites IX–X. 7. Mesonotum and metascutum. 8. Hind leg. 9. Forewing. 10. Abdominal tergite VII. 11. Abdominal sternite VII. Scale bars = 50 μ m.

forewing 795 (55); hind wing 694 (39); abdominal tergite IX 125 (200), setae S1–S3 210–220, SB1 38–42; ovipositor 145–155.

Male. Unknown.

Remarks. This new species is similar to *Y. ponkamui* Kudô, but can be distinguished from the latter by the following characters states: simple sensoria on antennal segment IV (vs. forked sensoria in *ponkamui*); two pairs of posteromarginal setae (vs. 3 pairs in *ponkamui*); setae S1–S3 on tergite IX long and

subequal (setae S1 shortest in *ponkamui*); abdominal segments I–III brown, IV yellow, V–X dark brown (vs. abdominal segments I–V brown and VI–X dark brown in *ponkamui*); and femur paler than tibia (vs. brown and as dark as tibia in *ponkamui*) (Kudô, 1985). Although setae S1–S3 on abdominal sternite VII are located slightly in front of posterior margin, but S2–S3 are located slightly ahead of S1; whereas S3 arises at posterior margin in *ponkamui* (Kudô, 1985). In addition, the new species can be



Figs 12 – 18. *Pseudoxystrips dentatus* (Knechtel). 12. Female. 13. Head. 14. Metanotum. 15. Forewing. 16. Abdominal tergites VII – X. 17. Fore leg. 18. Antennae. Scale bars = 30 μ m.

distinguished from *Y. pasehamui* Kudô by having spinula on metathoracic furca.

Etymology. This species is named after the type locality (Tianmu Mountain, Hangzhou, China).

Host. Grass (family Poaceae).

Distribution. China, Zhejiang Province.

Genus *Pseudoxystrips* Priesner New record to China

Pseudoxystrips Priesner, 1940: 51.

This genus includes two species in the world (zur Strassen, 2003; Mound, 2011), of which *P. dentatus* (Knechtel) is recorded here from China for the first time.

Generic diagnosis. Head with three pairs of ocellar setae, pair III situated posterior to hind ocelli (Fig. 13); antennae 8-segmented (Fig. 18), with forked sensoria on antennal segments III and IV; metanotum with campaniform sensilla that very close

to each other and near posterior of sclerite, median metanotal setae situated at anterior margin (Fig. 14); mesofurca with spinula; fore tarsi with large hook or tubercle on inner margin (Fig. 17). Abdominal tergite VII with or without comb on posterior margin; tergite X tube-like (Fig. 16); campaniform sensilla of abdominal tergites situated near posterior margin; sternites without discal setae; sternite VII with setae S1 situated anterior to posterior margin. Ovipositor well-developed.

Pseudoxystrips dentatus (Knechtel) New record to China (Figs 12 – 18)

Oxytrips Knechtel, 1923: 123.

Material examined. China, 1 ♀, Shandong Province, Jinan (23°35'N, 117°21'E; alt. 1545 m), from wheat, LU Hong, 27 May 2010 (in ZJUH).

Diagnosis. Female macropterous. Body dark brown, for legs distally illuminated, forewings

uniformly gray-brown, antennae brown, segment III yellow (Fig. 12).

Head. Head 1.2 times as wide as long (Fig. 13); three pairs of ocellar setae present, pair III situated outside of ocellar triangle, posterior to hind ocelli (Fig. 13); five pairs of postocular setae present. Maxillary palps 3-segmented. Antennae 8-segmented, with forked sense cones on antennal segments III and IV (Fig. 18); antennal segment I without median dorso-apical setae; segments III – VI with rows of microtrichia on both dorsal and ventral surfaces.

Thorax. Pronotum 1.4 times as wide as long, with one pair of more prominent posteroangular setae, and five pairs of posteromarginal setae; metanotum with campaniform sensilla that very close to each other and near the posterior of metascutum, median metanotal setae situated at anterior margin (Fig. 14); mesofurca with spinula, metafurca without spinula. Tarsi 2-segmented; fore tarsi with large hook or tubercle on inner margin (Fig. 17). Forewings first vein with 13 – 15 and second vein with 9 – 11 setae (Fig. 15); clavus with five veinal setae.

Abdomen. Abdominal tergites and sternites with small lobes on posterior margin; campaniform sensilla of tergites situated near posterior margin; tergites V – VII with weakly ctenidia laterally; tergite VIII on the median of posterior margin slightly wavy, and with posteromarginal comb stand on triangle lobe; a group of microtrichia situated antero-lateral of spiracles on tergite VIII; tergite X slender (Fig. 16); sternites without discal setae; sternite VII with setae S1 situated anterior to posterior margin. Ovipositor well-developed.

Measurements. Length (width): body 1 610 (330); head 160 (130); distance between to compound eyes 60. Pronotum 195 (135). Forewings 790 (60), hind wing 690 (45). Abdominal tergite IX 70; X 120; ovipositor 260. Antennal segments I to VIII as follows: 22 (31), 39 (34), 44 (27), 41 (27),

36 (23), 52 (23), 13 (10) and 18 (7).

Host. *Xeranthemum annuum* (family Asteraceae) (zur Strassen, 2003), wheat (family Poaceae).

Distribution. China, Shandong Province; Slovakia, Hungary, Romania, and Ukraine (zur Strassen, 2003).

Acknowledgements The authors wish to thanks Prof. TONG Xiao-Li of South China Agricultural University, Guangzhou, China and Dr. Richard zur Strassen of Senckenberg Museum, Frankfurt-Germany for their supplying some references.

REFERENCES

Knechtel, W. 1923. *Oxythrips dentatus* sp. nov. eine neue Thysanopteren spezies aus Roumäniem. *Bulletin de la Section Scientifique de l'Académie Roumaine*, 8: 122 – 125.

Kudō, I. 1985. *Yoshinothrips* gen. nov., with two new species from Japan (Thysanoptera: Thripidae). *Kontyū, Tokyo*, 53 (1): 81 – 89.

Masumoto, M. and Okajima, S. 2005. *Trichromothrips* Priesner (Thysanoptera: Thripidae) of Japan and Taiwan, with descriptions of four new species and a review of the *Trichromothrips* group of genera. *Zootaxa*, 1082: 1 – 27.

Mirab-balou, M. and Chen, X-X 2010. A new method for preparing and mounting thrips for microscopic examination. *Journal of Environmental Entomology*, 32 (1): 115 – 121.

Mirab-balou, M., Tong, X-L, Feng, J-N and Chen, X-X 2011. Thrips (Insecta, Thysanoptera) of China. *Check List (Journal of species lists and distribution)*, 7 (6): 720 – 744.

Mound, L. A. 2011. Thysanoptera (Thrips) of the World – a checklist. <http://www.ento.csiro.au/thysanoptera/worldthrips.html> (accessed 24 Apr. 2011).

Mound, L. A. and Marullo, R. 1996. The Thrips of central and South America: an introduction (Insecta: Thysanoptera). *Memoirs on Entomology International*, 6: 1 – 487.

Nonaka, T. and Jangyitaya, P. 1993. Bamboo-inhabiting thrips of the family Thripidae (Thysanoptera) from Southeast Asia I. *Japanese Journal of Entomology*, 61 (4): 737 – 747.

Priesner, H. 1940. On some Thysanoptera (Thripidae) from Palestine and Cyprus. *Bulletin de la Société Royal Entomologique d'Egypte*, 24: 46 – 56.

Zhang, W-Q and Tong, X-L 1996. A new species and some new records of Thripinae (Thysanoptera; Thripidae) from China. *Entomotaxonomia*, 18 (4): 253 – 256.

zur Strassen, R. 2003. Die terebranten Thysanopteren Europas und des Mittelmeer-Gebietes. *Die Tierwelt Deutschlands*, 74: 1 – 271.

中国杂草上生活的吉野蓟马属一新种及蓟马亚科一新纪录属

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摘要 报道了吉野蓟马属 *Yoshinothrips* Kudō, 1985 (蓟马科, 蓼马亚科) 在中国的 1 新种, 天目山吉野蓟马 *Y. tianmushanensis* Mirab-balou *et al.* sp. nov., 并编制了该属分

关键词 缨翅目, 蓼马亚科, 吉野蓟马属, 新种, 伪蓟马属, 新纪录, 中国.

中图分类号 Q969.34

种检索表。该种生活于杂草上。此外, 还记述了蓟马亚科中国 1 新纪录属, 伪蓟马属 *Pseudoxothrips* Priesner, 1940 及中国 1 新纪录种, 齿伪蓟马 *Pseudoxothrips dentatus* (Knechtel, 1923)。

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